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INTEROFFICE MEMORANDUM

DATE: November 6, 1996

TO: Distribution

FROM: Wayne Sproles, Accelerated Actions, T893B, x5790

SUBJECT: DRAFT PAM FOR THE SOURCE REMOVAL AT THE MOUND SITE

The development and review of the Draft PAM for the Source Removal at the Mound Site has been expedited to complete the public review and comment period during the Christmas holiday.

Project scoping meetings with Kaiser-Hill, DOE, and the regulatory agencies are scheduled as follows:

Kaiser-Hill Scoping Meeting - November 7, 1996, 10:00am, T893B, Conf. Rm. 68
DOE Scoping Meeting - November 8, 1996, 9:00am, T893B, Conf. Rm. 68
EPA/CDPHE Scoping Meeting - November 13, 1996, 9:30am, T893B, Conf. Rm. 68

Please provide comments no later than 9:00 am on November 7, 1996.

cc:

J. Anderson
M. Broussard
S. Evans
J. Law
A. Primrose
J. Schmuck
A. Tyson
M. Wood

1/29

ADMIN RECORD

I113-A-00045

PROPOSED ACTION MEMORANDUM FOR THE SOURCE REMOVAL AT THE MOUND SITE IHSS 113

November 6, 1996

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PROPOSED ACTION MEMORANDUM
FOR THE SOURCE REMOVAL AT THE MOUND SITE
IHSS 113

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ACRONYMS

ARARs . . . . . Applicable or Relevant and Appropriate Requirements
CCR . . . . . Colorado Code of Regulations
CERCLA . . . Comprehensive Environmental Response and Liability Act
CFR . . . . . Code of Federal Regulations
COC(s) . . . . . Contaminant(s) of Concern
CSFS . . . . . Contaminated Soil Feed Stockpile
CWTF . . . . . Consolidated Water Treatment Facility
DNAPL . . . . Dense Non-Aqueous Phase Liquid
FIDLER . . . . Field Instrument for the Detection of low Energy Radiation
GAC . . . . . Granulated Activated Carbon
HEPA . . . . High Efficiency Particulate Air
IAG . . . . . Interagency Agreement
IHSS . . . . . Individual Hazardous Substance Site
MCLs . . . . . Maximum Concentration Levels
NAAQS . . . . National Ambient Air Quality Standards
NEPA . . . . . National Environmental Policy Act
OSHA . . . . . Occupational Safety and Health Administration
OU . . . . . Operable Unit
OVA . . . . . Organic Vapor Analyzer
PA . . . . . Protected Area
PAM . . . . . Proposed Action Memorandum
PCE . . . . . Tetrachloroethene or Perchloroethene
PPM . . . . . Parts Per Million
RCRA . . . . . Resource Conservation and Recovery Act
RFA . . . . . Rocky Flats Alluvium
RFCA . . . . . Rocky Flats Cleanup Agreement
RFETS . . . . . Rocky Flats Environmental Technology Site
RFI/RI . . . . . RCRA Facility Investigation/Remedial Investigation
SAP . . . . . Sampling and Analysis Plan
TCE . . . . . Trichloroethene
TDU . . . . . Thermal Desorption Unit
TPH . . . . . Total Petroleum Hydrocarbons
UHSU . . . . . Upper Hydrostratigraphic Unit
VOC(s) . . . . . Volatile Organic Compound(s)

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1.0 PURPOSE

This Proposed Action Memorandum (PAM) outlines the approach that will be taken and the applicable requirements for the excavation and subsequent removal of volatile organic compounds (VOCs) from soil at the Rocky flats Environmental Technology Site (RFETS) Mound Site, also know as Individual Hazardous Substance Site (IHSS) 113, within Operable Unit 2.

This source removal is being conducted under the final Rocky Flats Cleanup Agreement (RFCA, DOE, 1996). The VOCs addressed by this action are Comprehensive Environmental Response and Liability Act (CERCLA) hazardous substances and Resource Conservation and Recovery Act (RCRA) hazardous waste constituents contained in an environmental media (soil). Removal and treatment of the hazardous substances will mitigate further degradation of groundwater in the area.

2.0 PROJECT DESCRIPTION

Between 1954 and 1958, drums containing depleted uranium and beryllium contaminated with hydraulic oil and carbon tetrachloride were stored at the Mound Site. Records also indicate that some of the drums contained enriched uranium, plutonium, and tetrachloroethylene (PCE). Prior to removal of the drums in 1970, some of the drums were know to have leaked, and the resulting contamination is impacting groundwater. It is expected that approximately 400 - 1,000 cubic yards (yd^3) of soil are contaminated with VOCs above the Tier 1 Subsurface Action Levels promulgated in the RFCA.

Under this action, the contaminated soils will be removed from the Mound Site and processed using thermal desorption, a process used successfully on several similar sites at the RFETS. At the conclusion of the project, the treated soil is expected to be returned to the Mound Site and the area will be restored to a comparable undisturbed condition. The intent of this source removal is to remove the contaminants of concern (COCs) that may leach into the groundwater. The groundwater at the Mound Site will be addressed as part of the site groundwater management strategy.

Information on site history, soil chemical and radiological contamination, geology and

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hydrogeology of the Mound Site has been collected over many years and documented in various reports. Information used to prepare this PAM has been taken from the *Rocky Flats Environmental Technology Site Historical Release Report for the Rocky Flats Plant*, the *Phase II RFI/RI Report for Operable Unit No. 2,* from a characterization study conducted in the spring of 1995, and from *Results of the 1996 Pre-Remedial Investigation of the Mound Site*. The location of the Mound Site is shown in Figure 2.0.

The RFCA Cleanup Action Levels used for determining the extent of excavation are given in Section 3.2.1. The performance or treatment standard for the thermal desorption unit (TDU) will be the RCRA Treatment Standards for Hazardous Waste (6 CCR 1007-3, 268.40) for the VOCs found in the Mound Site soils. These standards are given in Section 3.2.3.

2.1 Background

The Mound Site is located north of Central Avenue, and east of the Protected Area (PA) fence. Approximately 1,405 drums were placed at the mound site between April 1954 and September 1958. The drums originated from Building 444, Building 888, Building 883, Building 771, and Building 776. The drums primarily contained uranium and beryllium contaminated lathe coolant (a mixture of approximately 70 percent hydraulic oil and 30 percent carbon tetrachloride). Information also exists indicating that some of the coolant contained plutonium. In addition, some of the drums contained tetrachloroethene (PCE), which has been found in high concentrations in monitoring wells in and adjacent to the Mound Site, and in soil borings at the Mound Site. After being placed at the Mound Site, the drums were covered with soil, thus generating a "Mound".

In 1970, all drums were removed from the Mound Site along with some radiologically contaminated soil. Approximately 10 percent of the drums were thought to have holes at the time of removal. Solid material was shipped offsite for disposal, while liquids were sent to Building 774 for processing. No airborne radiological contamination was detected during the drum removal. Soil from the excavation was graded and the excess was placed in the landfill.

More recent characterization data indicates VOCs, predominantly tetrachloroethene (PCE) have been detected in subsurface soils and groundwater at levels requiring cleanup. Records do not exist of the volume of contaminants released to the soils at the site.

2.2 Hydrogeologic Setting

Characterization studies conducted at the Mound site are presented in the *Phase II RFI/RI Report for Operable Unit No. 2*, the *Soil Vapor Survey Report for OU2 Subsurface Interim Remedial Action*,

Figure 2.0. Location of the Mound Site at RFETS.

and the *Results of the 1996 Pre-Remedial Investigation of the Mound Site*. A brief summary of the data is presented below.

The native surface soils in the vicinity of the Mound Site have been disturbed (OU 2 RFI/RI Report, Figure 3.5-20) during the creation and removal of the Mound, construction of the PA fence, excavation of the Central Avenue ditch, and other construction activities in the area.

The hydrogeologic setting of the Mound Site area is as follows:

- Stratigraphy consists of 12 to 13 feet of Rocky Flats Alluvium (calcareous sandy gravel and clayey gravel) unconformably overlying claystone and sandstone of the Arapahoe Formation, which unconformably overlies the massive claystone and sandstone of the Laramie Formation.

- Groundwater seasonally ranges in depth from below the contact between the underlying Arapahoe Formation and the Rocky Flats Alluvium to about 6 feet below ground surface. The water table defined by wells completed in the Arapahoe Formation ranges in depth from 15 to 20 feet below ground surface.

- The groundwater flow direction in the Rocky Flats Alluvium is primarily to North. Seasonal recharge from ground surface and the Central Avenue ditch causes groundwater to flow towards the North at a gradient of 0.011 ft/ft.

- Mean hydraulic conductivities of the Rocky Flats Alluvium and weathered claystone are 2.06E-04 and 8.82E-07 cm/s, respectively.

- VOC contaminants that may originate from the Mound Site are observed in downgradient monitoring wells and seeps.

Figure 2.2 depicts the generalized hydrogeologic setting at the Mound Site.

2.3 Mound Contamination Data Summary

Four boreholes were drilled at the Mound Site during May 1995 and 16 boreholes were drilled during August 1996 for the purpose of characterizing and defining the extent of subsurface contamination. In addition, seven monitoring wells and six boreholes have been drilled in the

vicinity of the Mound Site during the past nine years. The location of these boreholes and wells are shown in Figure 2.3. Subsurface soil and groundwater contamination at the Mound Site is summarized below.

Figure 2.2 Generalized Hydrogeologic Setting at the Mound Site.

Figure 2.3 Location of Borholes and Wells at the Mound Site

2.3.1 Groundwater

Groundwater samples from upgradient wells (4386, 2387, 01791, 01891, and 12091) and downgradient wells (0174, 1987, 2087, 02091, 02191, and 02291) are summarized in Tables 2.3.1-1 and 2.3.1-2 which indicate an increase in PCE and trichloroethene (TCE) in the groundwater after passing under the Mound Site. These wells are screened in the Rocky Flats Alluvium and weathered claystone of the Arapahoe Formation (see Phase II RFI/RI Report of OU 2 for detailed geologic and hydrogeologic information). The presence of VOC contamination in the upgradient wells and possibly downgradient well 02091 has been traced to the 903 Pad or other potential sources. The increase in concentrations of PCE and TCE in the groundwater downgradient of the Mound Site indicates the site is a source of groundwater contamination.

TABLE 2.3.1-1
MOUND SITE UPGRADIENT GROUNDWATER SAMPLING RESULTS SUMMARY

Contaminant	Well 4386	Well 2387	Well 01791	Well 01891	Well 12091
PCE	0.0003	0.074	0.016	0.002	0.00059
TCE	<0.005	<0.005	0.001	<0.0002	0.0003

Note: all concentrations are maximum observed concentrations and reported in mg/L. PCE=tetrachloroethene, TCE=trichloroethene.

TABLE 2.3.1-2
MOUND SITE DOWNGRADIENT GROUNDWATER SAMPLING RESULTS SUMMARY

Contaminant	Well 0174	Well 02191	Well 02291	Well 1987	Well 2087
PCE	528	0.98	3.4	0.88	0.091 J
TCE	18	0.067	0.41	0.07	0.005

Note: all concentrations are maximum observed concentrations and reported in mg/L, J= Analyte detected below method practical quantitation limit. PCE=tetrachloroethene, TCE=trichloroethene.

2.3.2 Soil

Results from the Phase II RFI/RI, soil gas surveys, and the 1995 and 1996 subsurface investigations of the Mound Site indicate the highest levels of soil contamination are observed in the north-east

portion of the site (Table 2.3.2, Figure 2.3). The primary COCs found during previous soil investigations are the chlorinated solvent PCE and methylene chloride which exceed the RFCA Tier 1 Subsurface Soil Action Levels.

Volatile Organic Compounds in Soil

Four subsurface soil samples collected from borehole 14295 representing the interval from ground surface to a depth of 15 feet exceeded the VOC action level specified in Table 3.1. These four samples from 14295 contained concentrations of PCE ranging from 220 up to 760 mg/kg. Borehole 250296 was observed with 160 mg/kg PCE at a depth of 5.5 feet. Borehole 251696 was observed with 440 mg/kg PCE at a depth of 7 to 8 feet and 0.41 mg/kg PCE at a depth of 11 to 13 feet.

A composite soil sample was collected for waste characterization during the abandonment of well 0174 in 1992, which contained PCE at 72 mg/kg. This sample was believed to have been collected as a grab sample instead of a composite sample from the drill cuttings or borehole materials for the interval from ground surface to 26 feet. As such, where in the vertical profile that this sample represents can not be ascertained, it is likely that the sample could have come from soil contaminated by groundwater.

TABLE 2.3.2
SUMMARY OF TETRACHLOROETHENE CONCENTRATIONS IN SUBSURFACE SOILS AT THE MOUND SITE

BORING NUMBER	SAMPLE DEPTH (ft)	Methylene Chloride (mg/kg)	PCE (mg/kg)
0174	0-26		72
3687	0-24.5		ND
3787	11-26.2		ND
1791	9.6-9.8 15.6-15.8		0.003 J ND
2191	20.2-20.4 20.2-20.4		0.98E 0.15D
9891	6.3-6.5 10.5-10.7 15.6-15.8		0.001 0.003 0.006

9991	6.8-7 11-11.2 15.6-15.8 17.6-17.8 19.6-19.7		0.008 0.013 0.048 0.1 0.18
21793	0-16 23.1-23.4 27.5-27.8 31.6-31.9 35.1-35.4 39-39.3		0.009 0.13 0.17 0.1 0.032 0.004J
14195	4-6 10-12 18-20		0.002J 0.002J 0.006
14295	0-3.5 5-8 8-12 13.7-15 15.7-16 15.7-16 19.7-20 19.7-20		220 760 550 320 303E 250D 5.4E 250D
14395	4-6 4-6 15.7-16		0.61E 0.45D 0.006
14495	4-6 8-10 12.5-15 12.5-15		0.022 0.023 0.55E 0.52D
250196	4.5-5.5		0.6U
250296	1-2 3-4 5.1-5.5		1 36E 160E
250396	1-2 5-6		0.25J 0.6U
250496	2.5-3.5 7-8		0.6U 0.6U

250596	1-2 5-6		0.6U 0.6U
250696	3-4		0.6U
250796	4-5		0.6U
250896	0.5-1.5		0.6U
250996	4-5		0.6U
251096	4-5		0.6U
251196	4-5 9-10		0.6U 0.6U
251296	4-5 9-10		0.6U 0.6U
251696	4-5 5-6 7-8 8-9 9-10 11-13		0.6U 0.2J 440 96 75 0.41J

Note: J=analyte detected below method practical quantitation limit, D=dilution, E=estimated value, ND=analyte not detected, U=method practical quantitation limit.

Pesticides and Polychlorinated Biphenyls in Soil

No pesticides or polychlorinated biphenyls (PCBs) were detected above the RFCA Subsurface Soil Action Levels.

Metals in Soil

No metals were detected exceeding the RFCA Tier 1 Subsurface Soil Action Levels.

Radionuclides in Soil

No radioactive isotopes were detected above the RFCA Tier 1 or Tier 2 Subsurface Soil Action Levels. Only one soil sample approaches the RFCA Tier II Action Level for subsurface soil. This sample, BH20837WC from borehole 14295, was collected from ground surface to a depth of 3.5 feet and contained a uranium-238 concentration of 101.1 pCi/g. The Tier 2 Subsurface Soil Action Level for uranium-238 is 103 pCi/g. This sample was collected from the area of highest VOC contamination.

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3.0 PROJECT APPROACH

The proposed accelerated action will entail excavating soil contaminated with VOCs from the Mound Site and processing the soil using thermal desorption technology. Following thermal desorption, the treated soil will be returned to the site and the area revegitated. The project will be conducted in accordance with the RFCA guidelines.

3.1 Proposed Action Objectives

The accelerated action will remove VOC contaminated soils from the Mound Site, thereby mitigating further degradation of the surrounding soils and groundwater. The subsurface soils at the original Mound Site contain substantially higher concentrations of VOCs than the surrounding areas. This source removal will remediate one of the priority, top 10 IHSS sites at RFETS.

3.2 Proposed Action

This action will involve excavating approximately 400-1000 yd^3 of soil from the site using standard excavating equipment. The best estimate is that 600 yd^3 of soil will be removed. The soil will be temporarily stockpiled, awaiting thermal desorption processing. The stockpiled soil will be staged approximately 600 feet East of the Mound Site, in the area where the Thermal Desorption Unit (TDU) will be mobilized to process the soil. Following processing, confirmation sampling, and evaluation of data, soils meeting the treatment performance standards will be returned to the site and the site revegitated to a pre-job condition.

3.2.1 Excavation

Conventional excavation techniques will be used to remove the contamination source at the Mound Site. Excavation equipment will consist of a track-mounted excavator, backhoe, and/or front end loader. Contaminated soils will then be moved in dump trucks or similar transport to a staging area which is described in Section 3.2.2.

During soil handling activities dust minimization techniques, such as water sprays, will be used to minimize suspension of particulates. Earth moving operations will not be conducted during periods of high winds. The RFETS Environmental Restoration Field Operations Procedure FO.01, Air Monitoring and Dust Control provides guidance for monitoring of wind speed and work stoppage

during high winds.

Though not expected, if contamination is found during the excavation that requires the excavation of soils around existing wells, the wells may need to be abandoned, as appropriate. The Geotechnical Procedure GT-11, Plugging and Abandonment of Wells will be used for any well plugging or abandonment activities.

Organic vapor analyzers (OVA's) will be used as field screening tools to guide excavation activities. When project personnel estimate that VOCs have been removed, samples will be collected along the base and sides of the , in accordance with the Sampling and Analysis Plan (SAP), to establish the post-action condition of the subsurface soil. If VOCs are detected in the samples above the Cleanup Action Levels, excavation will continue until the samples collected around the excavation boundary are below the Action Levels described below, or until the limiting conditions established for the source removal are encountered.

If groundwater or bedrock is encountered and the Cleanup Action Levels have not been met, project personnel will make efforts to continue to remove as much contaminated soil as reasonable in accordance with the limiting conditions specified later in this section. Experience gained at similar excavations at RFETS indicates that limited excavation may be possible in the weathered bedrock using conventional techniques.

To minimize groundwater seepage, and to assist in trench wall stability, efforts will be made prior to excavation to inhibit the seasonal rise in water table around the Mound Site. It is thought that the Central Avenue ditch running along the Southern perimeter of the Mound Site is the primary cause of much of the local water level fluctuation at the Mound Site. Since this ditch is unlined, standing water may be recharging the soils at the Mound Site. Also, as part of the Mound Site excavation, the Northern wall of the Central Avenue ditch in the vicinity of the excavation will be removed, leaving a pathway for stormwater to run into the excavation. Therefore, prior to excavation, an extension to an existing culvert will be placed along the Southern perimeter of the Mound Site. This effort will minimize local recharge which will greatly simplify subsequent excavation activities.

Dewatering of the Mound Site excavation may also be necessary due to seasonally high water tables. If dewatering of the excavation is necessary, a field sump will be created in the bottom of the excavation and pumped out with a submersible pump into a temporary storage container(s). The water will then be treated in the Consolidated Water Treatment Facility (CWTF) located in Building 891. Following treatment, the water will be sampled and released in accordance with CWTF discharge criteria.

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Considering the bedrock and groundwater conditions and the possible depth of DNAPL contamination at the Mound Site, the excavation will be limited to the highly weathered bedrock just below the alluvial/bedrock contact. This highly weathered bedrock is expected to be approximately two to three feet below the top of bedrock.

Cleanup Action Levels used for the project excavation activities are the RFCA Tier I Subsurface Soil Action Levels. These Action Levels are being incorporated to prevent any further degradation above the Tier 1 Groundwater Action Levels. Table 3.1 lists the Cleanup Action Levels.

TABLE 3.1
CLEANUP ACTION LEVELS

Contaminant	Concentration (mg/kg)
Carbon Tetrachloride	11.0
Methylene Chloride	5.77
Tetrachloroethylene	11.5
Trichloroethene	9.27

The VOCs listed in Table 3-1 are the COCs for the project. This list was developed by assessing the existing analytical data from the site and by the use of process knowledge to ascertain what VOCs existed in the drums that were initially stored at the site. If, however, other VOCs are discovered through the project sampling activities, the appropriate Tier 1 VOC Cleanup Action Levels will be incorporated into the project. The sampling and analytical activities used to provide data to evaluate these Action Levels are described in the project SAP.

3.2.2 Staging of Contaminated Soils

Contaminated soil excavated from the Mound Site will be staged approximately 600 feet to the east of the Mound Site, an area already established to treat soils from the Ryan's Pit and the Trenches T-3 and T-4 source removals. This site was chosen because it is relatively flat, and contains support trailers and a power substation from the previous thermal desorption projects at RFETS. This soil will be stockpiled in a Contaminated Soil Feed Stockpile (CSFS). The CSFS will be designed to incorporate requirements of the RCRA Waste Pile Standards, specifically 6 CCR 1007-3, 264.250(c). The CSFS will have dimensions of approximately 50' x 100', established by concrete Jersey barriers. Features of the CSFS will include:

- Jersey barriers installed around three sides to contain the contaminated soil, to minimize storm water run-on and wind blown dispersion of soil.

- A water resistant tarpaulin, stretched across the jersey barriers to minimize the wind blown dispersion of soil, and commingling of soil with precipitation.

- A plastic-lined, gravel-filled trench surrounding the Jersey barriers. Accumulated storm water will be collected from a sump located at a corner of the trench with a trash pump or equivalent. This trench will be installed to collect surface run-on/run-off from the CSFS. Storm water collected from this trench may be used to control dust on soils awaiting treatment in the TDU; or will be collected for onsite treatment at Building 891.

After treating the stockpiled soil within the CSFS, any residual contaminated surface soil will be removed as necessary, and treated by the TDU. The Cleanup Action Levels will be used to evaluate the soils beneath the CSFS.

3.2.3 Processing

A low-temperature thermal desorption unit (TDU) will be used remove the VOCs in a non-destructive manner from the contaminated soils. The TDU is expected to be a batch process unit in which heated air is passed through the soil to volatilize or "strip" the VOCs from the soil into the vapor phase. A small vacuum is applied to the soils which further enhances the VOC stripping process. Depending on the specific thermal desorption vendor/unit selected, the treatment unit heats the soil to a temperature range between 120 and 700 degrees Fahrenheit. No incineration or destruction of VOCs occurs in the TDU at these temperatures.

The system will be equipped with a high efficiency particulate air (HEPA) filter to minimize particulate emissions. The off-gases will be captured and cooled in a condenser and subsequently polished using an activated carbon filter system. The condensed aqueous phase liquids will be removed from the condenser for further processing at the CWTF in Building 891. If organic phase liquids are recovered from the condenser, these liquids will be containerized for offsite disposal. Table 5.1 lists the Applicable or Relevant and Appropriate Requirements (ARARs) that will serve as the regulatory control for this project, including the operation of the TDU.

Following processing of soil through the TDU, the soil will be sampled and analyzed to verify that it meets the performance standards for treatment. The treated soil will then be returned to the Mound Site. Should the treated soil fail to meet the standards, the soil will continue to be processed until it

meets the performance standards. The performance standards are the RCRA Treatment Standards for Hazardous Waste for the chlorinated solvent based VOCs, which are the COCs for this project. These standards were taken from the Colorado Code of Regulations (CCR) under Part 6 CCR 1007-3, 268.40. The standards for the Mound Site COCs are listed in Table 3.2.

TABLE 3.2
TDU PERFORMANCE STANDARDS

Contaminant	Concentration (mg/kg)
Carbon Tetrachloride	6.0
Methylene Chloride	5.77*
Tetrachloroethylene	6.0
Trichloroethene	6.0

* Note: Though the hazardous waste regulations stipulate a 30 mg/kg treatment performances standard, this concentration exceeds the "put back", Tier 1 Action Levels specified by RFCA, and used to guide the activities stated in Section 3.2.1. Therefore, the more conservative RFCA Action Levels is used instead of the standard promulgated in the hazardous waste regulations.

3.3 Worker Health and Safety

Due to the contaminants present at the Mound Site, this project falls under the scope of the Occupational Safety and Health Administration (OSHA) construction standard for Hazardous Waste Operations and Emergency Response, 29 CFR 1926.65. Under this standard, a Site-Specific Health and Safety Plan will be developed which addresses the safety and health hazards of each phase of site operations and specifies the requirements and procedures for employee protection. In addition, the DOE Order for Construction Project Safety and Health Management, 5480.9A, applies to this project. This order requires the preparation of Activity Hazard Analyses which specify hazards to which employees may be exposed during each phase of the project and the appropriate control measures to be used. These requirements will be integrated wherever appropriate.

This project involves potential worker exposures to physical, chemical, and low levels of radiological hazards. The potential physical hazards include those associated with excavation

activities, use of heavy equipment, noise, heat stress, cold stress, and work on uneven surfaces. Appropriate skin and respiratory personal protective equipment will be worn throughout the project. Routine VOC monitoring will be conducted with an organic vapor monitor for any employees who must work near the contaminated soil (i.e. soil sampling or personnel). Based on employee exposure evaluations, the Site Health and Safety Officer may downgrade personal protective equipment requirements, if appropriate. If field conditions vary from the planned approach, an Activity Hazard Analysis will be prepared for the existing circumstances and work will proceed according to the appropriate control measures.

Additionally, field radiological measurements will be performed using a Field Instrument for the Detection of low Energy Radiation (FIDLER) and other appropriate equipment to detect surface contamination by Site Radiological Control Technicians (RCTs). Dust minimization techniques will be used to minimize suspension of contaminated soils.

3.4 Waste Management

The soils processed in the TDU will be returned to the Mound Site, after a determination that treated soils have attained the treatment performance standards. Based on previous sampling investigations it has been determined that the soils meet the RFCA Tier 2 levels for all radionuclides of concern. Additional sampling for radioisotopes will be performed if direct monitoring indicates that radionuclide levels are elevated above Tier 2 values.

Any ancillary wastes generated as part of this proposed action, such as personal protective equipment, will be characterized based on process knowledge and radiological screening. The wastes will then be managed, recycled, treated, and or disposed according to RFETS policies and procedures and in accordance with Federal, State, and local laws and regulations.

The residuals collected as part of the thermal treatment process, such as granulated activated carbon (GAC), the aqueous and organic phase condensate, and the HEPA filters will be managed according to the knowledge of the process that generated the residual wastes, radiological screening, and where appropriate, additional analytical characterization. The spent GAC generated from polishing the TDU's offgas is expected to be managed as a hazardous waste. If feasible, the GAC may be sent offsite for regeneration, and later reuse. The aqueous phase condensate will be treated onsite at the Consolidated Water Treatment Facility located in Building 891. If an organic phase condensate is recovered, this material will be packaged for off-site incineration. The HEPA filters are anticipated to contain low levels of radionuclides and will be managed onsite until they can be sent to an approved disposal facility.

4.0 ENVIRONMENTAL IMPACTS

The National Environmental Policy Act requires that actions conducted at RFETS be evaluated for potential impacts to the environment. Impacts to the natural environment resulting from the proposed action will be minimal. The impacts are not expected to result in any adverse impacts to wetlands, floodplains, threatened or endangered species or their habitats, or historic or cultural resources. There will be minor releases of air pollutants from heavy equipment operation during as well as minor increases in particulates (dust) associated with the operation of loading, unloading, and transferring soil to and from the TDU. Airborne particulates and contaminants resulting from the activities will be controlled using best management practices, including water sprays and covering. Once the removal of the contaminant source from the Mound Site is complete and the processed material is returned to the Mound Site, the site will be restored with appropriate vegetation.

5.0 COMPLIANCE WITH ARARS

(Note John Shmuck is currently revising this section)
In accordance with the RFCA, accelerated actions at RFETS must identify and comply, to the extent practicable, with Federal and State Applicable or Relevant and Appropriate Requirements (ARARs). ARARs relating to this action are identified in this section and summarized in Table 5.1. There are no chemical-specific ARARs or location-specific ARARs for this proposed action.

The Colorado Air Pollution Prevention and Control Act standards for emissions (5 CCR 1001-3, 5 CCR 1001-9) have been identified as action-specific ARARs. Based on data available from the previous Mound Site characterizations, the anticipated air emissions will be calculated to determine what type of control measures will be needed to ensure compliance with the standards. This analysis will be provided to the Colorado Department of Public Health and the Environment prior to the start of operations. In addition, requirements of 5 CCR 1001-14 will be incorporated into the project to assure the quality of ambient air in compliance with the National Ambient Air Quality Standards (NAAQS).

Additionally, the National Emission Standards for Hazardous Air Pollutants (40 CFR 61, Subpart H) have been identified as action-specific ARARs to evaluate potential radionuclide emissions. The effective dose equivalent will be calculated for those emissions anticipated from the operations associated with and the thermal desorption process. As a result of the radionuclides present in the near surface soil at the Mound Site, radiation exposure guidelines contained in 10 CFR 835

will also be followed to ensure protection of the workers. 10 CFR 835, Radiation Protection of Occupational Workers, sets the requirements for all aspects of radiological controls for this project. Requirements contained in this regulation are implemented in the Site radiological procedures. All applicable Site procedures will be followed during this project.

Contaminated soil removed from the Mound Site will be considered environmental media containing CERCLA hazardous substances and RCRA listed hazardous waste constituents. Excavated soil will be stored in a temporary structure awaiting processing in the TDU. To the extent practicable this structure will meet the Waste Pile requirements of 6 CCR 1007-3, 264.250(c). Section 3.2.2 of this plan describes the specifications of the unit.

Contaminated soils will be treated onsite using a low-temperature thermal desorption unit. This Unit is being established as a *Miscellaneous Unit*, regulated under 6 CCR 1007-3, Part 264, Subpart X. Environmental evaluations required by Subpart X status such as surface soil, geology and hydrology are contained in the RCRA Facility Investigation/Remedial Investigation Report for Operable Unit 2, particularly Chapters 2, 3, and 4. To the extent practicable, operation of the Miscellaneous Unit will be conducted in accordance with 6 CCR 1007-3, Part 264, Subparts AA and BB, *Air Emissions Standards for Process Vents and Equipment Leaks*. Other relevant and appropriate requirements such as 6 CCR 1007-3, Part 265, Subpart P, *Thermal Treatment* will be incorporated to provide operating parameters which are appropriate for treatment using thermal desorption technology.

Soil treated in the TDU will be required to meet the *Standards for Hazardous Waste* for the VOC constituents (6 CCR 1007-3, 268.40) prior to being returned to the Mound Site. These standards are required under the RCRA Land Disposal Restrictions program. In addition, the same Tier 1 Subsurface Soil Action Levels required by the RFCA, and used to guide the activities will be met prior to backfilling with the treated soil. In addition, soils returned to the Mound Site will be required to meet the RFCA Tier 2 Subsurface Soil Action Levels for Radionuclides, in order for the site to be designated for unrestricted release.

Remediation waste generated during this removal action will be evaluated under 6 CCR 1007-3, Part 261, *Identification and Listing of Hazardous Waste*. Hazardous remediation wastes generated as part of the waste processing will be stored in *Temporary Units* established under 6 CCR 1007-3, 264.553. This status is appropriate because of the short duration of operation of the unit, the limited potential for release from the unit and the type of unit being established (container storage area).

TABLE 5.1
ARARs for the Proposed Action of the Mound Site

Action	Requirement	Prerequisite	Citation	ARAR
Air Quality	Compliance with air emissions	Prevention of exceeding emissions for particulates and VOCs	5 CCR 1001-3 5 CCR 1001-9	Applicable
Air Quality	Compliance with NAAQS	Maintain quality of ambient air for particulate matter	5 CCR 1001-14	Applicable
Air Quality	Compliance with air emissions	Calculations to determine that radionuclide emissions do not exceed 0.1 mrem/yr.	40 CFR 61, Subpart H	Applicable
Radiation Protection	Compliance with radiation exposure levels	Ensure radiation contamination/ exposure resulting from removal action does not exceed approved limits.	10 CFR 835	Applicable
Hazardous Waste	Waste pile design requirements	Design waste pile such that the pile is protected from surface water run-on and operated to control the dispersal of soil by wind	6 CCR 1007-3, 264.250(c)	Applicable
Corrective Action for Hazardous Waste	Temporary unit container storage requirements	Operate temporary container storage area	6 CCR 1007-3, 264.553	Applicable
Hazardous Waste	Compliance with container management	Manage container condition, compatibility of waste, inspections, containment, and	6 CCR 1007-3, 264 Subpart I	Applicable
Hazardous Waste Treatment	Treatment Standards for Hazardous Waste for the VOCs	Used to evaluate treatment performance	6 CCR 1007-3, 268.40	Applicable
Hazardous Waste	Thermal treatment operating standards	Operate thermal treatment unit	6 CCR 1007-3, 265 Subpart P	Relevant and Appropriate Appropriate
Process Air Emissions	Compliance with air emissions standards for process vents and equipment leaks	Operate treatment systems that contact hazardous wastes with organic concentrations of at least 10 ppm by weight	6 CCR 1007-3, 264 Subpart AA and Subpart BB	Applicable
Hazardous Waste Operations	Hazardous Waste Operating Standards	Operate Hazardous Waste unit	6 CCR 1007-3, 264 Subpart X	Applicable

6.0 IMPLEMENTATION SCHEDULE

The excavation of contaminated soils from the Mound Site is scheduled to commence in the spring of 1997. Treatment of the contaminated soils is scheduled to begin in the early summer of 1997. Data reduction and reporting efforts are scheduled to be completed by the end of the summer of 1997. Any delays, scope, or budget changes may affect these dates.

7.0 REFERENCES

DOE, Final Rocky Flats Cleanup Agreement, 1996

DOE, Phase II RFI/RI Report for Operable Unit No. 2,- 903 Pad, Mound, and East Trenches Area, 1995

EG&G, Rocky Flats, Inc., Soil Vapor Survey Report for the OU2 Subsurface Interim Remedial Action. Draft, January, 1994

RMRS, 1996. Results of the 1996 Pre-Remedial Investigation of the Mound Site, RF/RMRS-96-0055.UN, September 27, 1996

RMRS, 1996 Sampling and Analysis Plan to Support the Source Removal at the Mound Site, IHSS 113, RF/RMRS-97-XXXX.XX, Month, 1996??

MOUND SITE SOURCE REMOVAL PROJECT FILES
IHSS 113

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C	Correspondence
D	Engineering
E	Cost/Estimates
F	Schedules
G	Procurement McClaren Hart
H	Construction
I	Miscellaneous

Health and Safety Plan
Health and Safety Plan for TDU
- McLaren Hart
Completion Report
Close Out Report
Field Implementation Plan for the Mound Site

MC LAREN HART

McLaren Hart Logbooks

- Industrial Hygiene and Radiological Instrumentation Calibration/Performance Log
- Dally Health and Safety Log
- Industrial Hygiene Employee Notification-TDU IHSS 113
- Radiological Contamination Survey Log
- Radiological Air Monitoring Log
- MH Project Manager
- MH Day Shift Supervisor
- MH Day Shift Leadman
- MH Night Shift Supervisor
- MH Night Shift Leadman
- MH Day Shift QA/QC Tech
- MH Night Shift QA/QC Tech
- MH Condensate Pump Log
- MH Process Control Logbook

Mound Site Soil Work Plan prepared by McLaren Hart

IRV-150 Operator Aids Manual - 2 vols.

Training Records - MH

Qualification Matrix

NIST Certificates

Drug Screens

RMRS Logs

- Field Supervisor's Logbook - Mark Wood#2
- Field Supervisor Logbook for TDU Soil
  Mike Bemski
- Field Supervisor's Logbook - Mark Wood
  #1
- Sampling Logbook
- Field Logs - March '97 Vol I
- Field Logs - March '97 Vol II
- Field Logs - July '97, Vol I
- Field Logs - July '97, Vol II
- Completed Field Forms
- CFFS and Mound Site Inspection Log
- Field Data Sheets/Logs
  Original Mound Site Excavation
  Mound Site Re-Excavation

Briefings/Overheads
Training
Integrated Work Packages
Health and Safety Plan Development File